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BRIEF REPORT

A Community-Based Survey of Posttraumatic Stress Disorder in the Netherlands

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In this study, the lifetime prevalence of stressful events and current posttraumatic stress disorder (PTSD) in the general adult population in the Netherlands were examined, and risk groups for PTSD were determined. A representative sample of 2,238 adults (≥18 years) in the Netherlands completed digital questionnaires by computer-assisted self-interviewing. In total, 52.2% of the population reported at least one stressful event throughout their life. The estimated prevalence of current PTSD in the total population was 3.8%. Rape and physical assault were the stressful events most likely to be associated with PTSD, witness of injury the least likely. Stressful medical events were moderately associated with PTSD. Prevalence of PTSD was elevated among single women and middle-aged men.

Epidemiological studies on posttraumatic stress disorder (PTSD) in the United States show a lifetime prevalence rate of 5–10% and a current prevalence of 1–5% in adult populations (Breslau et al., 1998; Kessler, Chiu, Demler, Merikangas, & Walters, 2005; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). Large national surveys are relatively scarce, and only a few studies describe prevalence rates of PTSD in Europe. Lifetime (2–6%) and current (1%) PTSD prevalence rates in Europe are lower than PTSD prevalence in the American studies (Alonso et al., 2004; Frans, Rimmo, Aberg, & Fredrikson, 2005; Perkonigg, Kessler, Storz, & Wittchen, 2000). However, findings across studies are hard to compare. The objective of our study was to examine the lifetime prevalence of stressful events and current PTSD in the general adult Dutch population. Furthermore, sociodemographic risk groups for PTSD were identified.

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METHOD

Participants

Computer-assisted self-interviewing (CASI) was used for data collection. Data collection took place from January to February 2006 and was carried out in cooperation with TNS NIPO, a Dutch market research agency in Amsterdam, the Netherlands. TNS NIPO owns a large access panel (around 150,000 potential respondents). Participants in the access panel have been collected over several years. Each household is used relatively infrequently, is rewarded for participation, and their privacy is respected. Respondents are able to answer the questions at their own computer at a time that is convenient for them, and they can take as much time as they want to answer the questions. This approach increases response rates and data quality (Bronner & Kuijlen, 2007), and respondents experience more privacy and anonymity with CASI. This method does not require interviewers to be present, so interviewer effects are avoided. Respondents are therefore inclined to be less inhibited in answering questions because there is no need to show socially desirable behavior (Clark Newman et al., 2002). Furthermore, data collection with CASI includes no missing values due to the computer-controlled routing (Bronner & Kuijlen, 2007).

TNS NIPO uses DIANA, a software program for sampling and weighing procedures (TNS NIPO Software, 2006). With the objective of obtaining at least 1,500 respondents, a stratified sample of 2,500 adults 18 years or older was drawn from the access panel. The gross sample was stratified on the basis of Dutch population figures regarding key demographics (age, sex, marital status, education, and urbanicity). Within these strata, potential respondents were randomly selected. The stratified random sampling technique was used to minimize sample variance and to increase precision. After the initial sampling, the net sample of respondents was poststratified to eliminate small nonresponse effects. Strata were formed based on combinations of key demographics (for example, male/18–24/less educated). Respondents in any one stratum received the same individual weight, and the average of all weights was 1.0 so that total sample size before and after weighting remained the same. Applying these weights provides statistical estimates that are representative of the general Dutch population and reduces sampling error (Biemer & Christ, 2008).

Measures

The PTSD questionnaire started with a section of the Composite International Diagnostic Interview (CIDI) for stressful events (Andrews & Peters, 1998). This section comprises nine questions of specified stressful events as well as an extra open question about severe pediatric illness and injury and any other stressful event. People were asked about the lifetime prevalence of these stressful events. When more than one stressful event was mentioned, they were asked which experience they suffered from most. For this most severe event, the time since occurrence and the person's response at that moment was assessed according to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (*DSM-IV*; American Psychiatric Association, 1994) Criterion A2. Subsequently, PTSD was assessed for events that involved intense fear, helplessness, or horror.

Posttraumatic stress disorder was measured with the Self-Rating Scale for PTSD (SRS-PTSD; Carlier, Lamberts, Van Uchelen, & Gersons, 1998). This is a Dutch self-report questionnaire and contains 17 items corresponding to the diagnostic *DSM-IV* symptoms of PTSD. The diagnosis of PTSD is likely if at least one intrusion, three avoidance and two hyperarousal symptoms were present in the previous 4 weeks. The SRS-PTSD demonstrated adequate psychometric properties in a sample of air crash survivors (Carlier et al., 1998). The reliability of this questionnaire was good (Cronbach's $\alpha = .96$). The sensitivity (86%) and specificity (80%) compared to a structured clinical interview (SI-PTSD; Davidson, Smith, & Kudler, 1989) were sufficient. The instrument was regarded as a good alternative to the structured interview for PTSD, particularly at sites that have limited clinical resources (Brewin, 2005; Carlier et al., 1998).

The 11th open-ended question about "any other stressful event" was classified into two additional categories by two independent psychologists: (a) death of a loved one (38.7%), and (b) severe disease (19.0%). The interrater reliability between the two psychologists was good ($\kappa = .88$).

Data Analysis

The Statistical Package for Social Sciences (SPSS) version 14.0 for Windows was used for all statistical analyses. Response data were weighted on the basis of stratum weights for all analyses. Each respondent was provided a weight by TNS NIPO with DIANA software (TNS NIPO Software, 2006). Prevalence figures and PTSD were calculated for the different types of stressful events. A multivariate analysis was conducted to identify sociodemographic risk factors (sex, age, marital status, education, and urbanicity) for PTSD. Because strong interactions between these risk factors were suspected, the analysis was performed with the chi-squared automatic interaction detector (CHAID) algorithm rather than logistic regression. CHAID is a type of decision tree technique. This technique can both be used as prediction (like logistic regression) and for detection of interaction between variables (Kass, 1980). The algorithm recursively splits up the dataset by detecting the best predictor of PTSD among the five sociodemographic characteristics, creating associated subgroups of high and low risk. Each of the subgroups is then independently analyzed in the same way, and the process is continued until no more statistically significant associations can be found. Notably, the CHAID algorithm requires the use of round weights. For this reason, the analysis was carried out with rounded weights, and the results were afterwards corrected

Table 1. Lifetime Prevalence of Experienced Stressful Events, Prevalence of Most Severe Stressful Events, and Current Conditional Probabilities of PTSD in the General Dutch Population Sorted by Current PTSD (%) ($N = 2{,}238$)

	Experienced event		Most severe event		Current PTSD				
Event	*n*	%[a]	*n*[b]	%[c]	*n*	%[d]	*SE* (%)	OR	95% CI
Rape	57	2.6	24	42.1	8	33.3	9.9	4.1	1.7–9.9
Physical attack or assault	139	6.2	58	41.7	12	20.7	5.4	2.1	1.1–4.2
Death of a loved one[f]	208	9.3	146	70.2	23	15.8	3.0	1.6	0.9–2.6
Other stressful event	228	10.2	134	58.8	19	14.2	3.0	1.3	0.8–2.3
Combat	43	1.9	9	20.9	1	–[e]	–	–	–
Sexual molestation	171	7.6	82	48.0	7	8.5	3.2	0.7	0.3–1.6
Severe disease[f]	101	4.5	52	51.5	4	7.8	3.7	0.6	0.2–1.8
Pediatric illness or injury	126	5.6	64	50.8	4	6.3	3.1	0.5	0.2–1.4
Life-threatening accident	194	8.7	38	19.6	2	5.3	4.0	0.4	0.1–1.8
Threat with weapon	90	4.0	21	23.3	1	4.8	4.1	0.4	0.0–2.8
Natural disaster or fire	249	11.1	51	20.5	2	3.9	3.0	0.3	0.1–1.3
Witnessed injury or killing	261	11.7	53	20.3	1	1.9	1.4	0.1	0.0–1.0
Total experienced events	1867								
Total	2238		731	32.7	84	11.5	1.2		

Note. PTSD = Posttraumatic stress disorder. Data are weighted regarding key demographics in the national Dutch population to adjust for sample bias. All counts are based on (fractional) case weights and rounded to the nearest integer value afterwards.
[a]Number of experienced events divided by total sample size ($N = 2{,}238$) times 100%. [b]Filter questions: (1) most severe event (2) responded with intense fear (*DSM-IV* Criterion A2). [c]Number of most severe events divided by number of experienced events times 100%. [d]Number of respondents with current PTSD divided by number of most severe events times 100%. [e]Conditional probability for combat is not calculated due to small sample size. [f]Additional categories from the open-ended question.

with the original weights. The classification tree was subsequently analyzed for spurious interactions using chi-squared testing.

RESULTS

In this survey, 2,238 (net sample) of the 2,500 (gross sample) persons (≥18 years) completed the PTSD questionnaire. In total, 51.0% of the population was female, half was under the age of 45 (49.9%), and almost three quarters (72.5%) was married or living with a partner. In addition, half of the population (47.1%) lived in a rural area and almost one third (28.6%) had a low educational level. These estimates are representative of the general Dutch population (http://www.cbs.nl).

Estimates of the lifetime prevalence of experienced stressful events are presented in Table 1. In total, 1,168 out of 2,238 (52.2%) persons reported at least one stressful event throughout their life. Moreover, 452 of these 1,168 (38.7%) persons experienced more than one stressful event (range = 2–7), resulting in 1,867 experienced events. In addition, 731 (32.7%) persons reported their most severe event and fulfilled Criterion A. Thirteen percent experienced this most severe event in the last year, 40.9% between 1 and 10 years, and 46.1% more than 10 years ago.

The estimated prevalence of current PTSD in the total population was 3.8% (84 out of 2,238) with a conditional probability of 11.5% (84 out of 731). In total, 2.2% of men and 5.3% of women currently experienced PTSD. The conditional probability of PTSD varied widely within the stressful events (Table 1). Rape (33.3%) and physical assault (20.7%) were most likely to be associated with PTSD, witness of injury or killing (1.9%) the least likely. Stressful medical events (severe disease, illness or injury of a child, and life-threatening accident) were moderately associated with PTSD.

Five different risk groups were identified by the CHAID algorithm (Table 2). Unmarried or divorced women and widows had the highest risk of PTSD after experiencing a stressful event, followed by middle-aged men. The resulting classification was significantly associated with PTSD, χ^2 (4, $N = 1168$) = 37.6, $p < .001$. Post hoc analysis revealed that, similar to women, unmarried and divorced men have increased risks of PTSD. However, the association between age and PTSD was gender-specific, applying only for men.

DISCUSSION

Stressful events are commonly experienced in the general Dutch population. However, the estimated prevalence of current PTSD in the total population was 3.8%, with a conditional probability of 11.5%. Rape and physical assault were strongly associated with

Table 2. Sociodemographic Subgroups Resulting From CHAID Analysis on the Dataset of People in the Sample From the General Dutch Population Who Experienced a Stressful Event ($N = 1168$)

Subgroup		Total *n*	Current PTSD %
Gender	Marital status		
Female	Married or living with partner	424	7.5
	Unmarried, divorced, or widowed	172	16.3
	Age		
Male	≤45 years old	262	1.9
	>45 and ≤55 years old	99	13.1
	>55 years old	211	3.3

Note. CHAID = chi-squared automatic interaction detector; PTSD = posttraumatic stress disorder. Data are weighted regarding key demographics in the national Dutch population to adjust for sample bias. All counts are based on (fractional) case weights and rounded to the nearest integer value afterwards.

PTSD. Prevalence of PTSD was elevated among single women and middle-aged men.

This is one of first studies that examine the occurrence and prevalence rates of PTSD in Europe in the general population. The prevalence of current PTSD in the Netherlands equals prevalence rates in the United States (3.5%; Kessler et al., 2005). Besides, consistent with previous epidemiological studies conducted in the United States (Breslau et al., 1998; Kessler et al., 1995, 2005; Resnick et al., 1993), Australia (Creamer, Burgess, & McFarlane, 2001), and Europe (Alonso et al., 2004; Frans et al., 2005; Perkonigg et al., 2000), the present study found high levels of PTSD after sexual and physical assault. Likewise, two studies that used the same measurement for stressful events show amazingly similar results in terms of occurrence (e.g., rank ordering of these events; Creamer et al., 2001; Kessler et al., 1995). In addition, Kessler et al. (1995) also found evidence of increasing PTSD prevalence among women, previously married, and older men.

Interestingly, the results of this study indicate that a number of persons in the general population have PTSD after stressful medical events like severe disease and injury or illness of a child. PTSD can have severe and long lasting consequences. Therefore, it is of utmost importance that physicians and pediatricians are aware of PTSD symptomatology and screen for PTSD in current practice. Moreover, one representative study in the general population (Breslau et al.1998) included these stressful medical events. Future epidemiological research should study PTSD prevalence in such events more systematically.

Findings of the present study must be considered in light of a number of limitations. A structured clinical interview is regarded as the best measurement for PTSD. The use of digital self-reports only gives an indication of PTSD. Furthermore, the current study did not screen for clinically significant impairment in important areas of functioning Criterion F (*DSM-IV*), which could have led to overestimation of PTSD. Another limitation is that there may be unmeasured factors that are related to PTSD and have negatively influenced the response in the digital self-reports. Examples are history of psychopathology, history of life events, and neuroticism. A final limitation is that the retrospective design could have caused recall bias. This bias is characterized by differences in accuracy of recalling past events by the respondent.

Despite these limitations, the present study is one of the first community-based surveys in Europe. Findings indicate that prevalence rates of PTSD in the Netherlands are comparable to the United States.

REFERENCES

Alonso, J., Angermeyer, M. C., Bernert, S., Bruffaerts, R., Brugha, T. S., Bryson, H., et al. (2004). Prevalence of mental disorders in Europe: Results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. Acta Psychiatrica Scandinavica, 109(Suppl 420), 21–27.

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.

Andrews, G., & Peters, L. (1998). The psychometric properties of the Composite International Diagnostic Interview. Social Psychiatry and Psychiatric Epidemiology, 33, 80–88.

Biemer, P. P., & Christ, S. L. (2008). Weighting survey data. In E. D. de Leeuw, J. J. Hox, & D. A. Dillman (Eds.), International handbook of survey methodology (pp. 317–341). Mahwah, NJ: Erlbaum.

Breslau, N., Kessler, R. C., Chilcoat, H. D., Schultz, L. R., Davis, G. C., & Andreski, P. (1998). Trauma and posttraumatic stress disorder in the community: The 1996 Detroit Area Survey of Trauma. Archives of General Psychiatry, 55, 626–632.

Brewin, C. R. (2005). Systematic review of screening instruments for adults at risk of PTSD. Journal of Traumatic Stress, 18, 53–62.

Bronner, A. E., & Kuijlen, T. (2007). The live or digital interviewer: A comparison between CASI, CAPI and CATI with respect to differences in response behaviour. International Journal of Market Research, 49, 167–190.

Carlier, I. V., Lamberts, R. D., Van Uchelen, A. J., & Gersons, B. P. (1998). Clinical utility of a brief diagnostic test for posttraumatic stress disorder. Psychosomatic Medicine, 60, 42–47.

Clark Newman, J., Des Jarlais, D. C., Turner, C. F., Gribble, J., Cooley, P., & Paone, D. (2002). The differential effects of face-to-face and computer interview modes. American Journal of Public Health, 92, 294–297.

Creamer, M., Burgess, P., & McFarlane, A. C. (2001). Post-traumatic stress disorder: Findings from the Australian National Survey of Mental Health and Well-being. Psychological Medicine, 31, 1237–1247.

Davidson, J., Smith, R., & Kudler, H. (1989). Validity and reliability of the DSM-III criteria for posttraumatic stress disorder. Experience with a structured interview. Journal of Nervous and Mental Disease, 177, 336–341.

Frans, O., Rimmo, P. A., Aberg, L., & Fredrikson, M. (2005). Trauma exposure and post-traumatic stress disorder in the general population. Acta Psychiatrica Scandinavica, 111, 291–299.

Kass, G. V. (1980). An exploratory technique for investigating large quantities of categorical data. Applied Statistics, 29, 119–127.

Kessler, R. C., Chiu, W. T., Demler, O., Merikangas, K. R., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. Archives of General Psychiatry, 62, 617–627.

Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. Archives of General Psychiatry, 52, 1048–1060.

Perkonigg, A., Kessler, R. C., Storz, S., & Wittchen, H. U. (2000). Traumatic events and post-traumatic stress disorder in the community: Prevalence, risk factors and comorbidity. Acta Psychiatrica Scandinavica, 101, 46–59.

Resnick, H. S., Kilpatrick, D. G., Dansky, B. S., Saunders, B. E., & Best, C. L. (1993). Prevalence of civilian trauma and posttraumatic stress disorder in a representative national sample of women. Journal of Consulting and Clinical Psychology, 61, 984–991.

TNS NIPO Software. (2006). DIANA [Computer software]. Amsterdam: Author.